

local control rate was 82% (95% CI: 76-91%). Complete toxicity data were available for 143 patients: 22% of them presented a G3+ acute toxicity, mainly as moist desquamation (n = 25) or diarrhoea (n = 10). Three patients presented a late grade 3 gastrointestinal toxicity (anal incontinence). No grade 4 acute or late toxicity was recorded. Patients treated with standard dynamic IMRT presented a significantly higher risk of acute grade 3 or more toxicity compared to those treated with VMAT or HT (38.5% vs 15.3%, p = 0.049).

#### Conclusion

Modern IMRT (VMAT or HT) with daily IGRT are effective and safe in treating AC patients, and should be considered the standard of care in this clinical setting.

#### EP-1260 Helical Tomotherapy with Daily Image Guidance for Rectal Cancer patients

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#### Purpose or Objective

Helical Tomotherapy (HT) has only been recently introduced in the neoadjuvant treatment of locally advanced rectal cancer (LARC) patients (pts). Aim of this retrospective study is to report the results in terms of toxicity and local control of the largest population treated with neoadjuvant HT and chemotherapy (CRT) with daily image guidance (IGRT) followed by surgery.

#### Material and Methods

Data of 117 patients LARC pts treated in 2 Swiss Radiotherapy departments were collected and analyzed. Radiotherapy (RT) consisted of 45 Gy (1.8 Gy/fraction, 5 days/week for 5 weeks) to the regional lymph nodes. Seventy pts also received a simultaneous-integrated boost (SIB) up to a total dose of 50 Gy to the tumor (2 Gy/fraction, 5 days/week for 5 weeks). Chemotherapy consisted of capecitabine 850 mg/m<sup>2</sup>, twice daily, during the RT days. Following a mean interval after completion of CRT of 53 days (range, 13-142), all pts underwent surgery. Ninety-four patients (80.3%) received a low anterior resection (LAR), while 23 pts (19.7%) received an abdomino-perineal resection (APR). The resection status was classified as R0 in 107 patients, and R1 in 3 patients (not reported in 7 patients).

#### Results

The overall rate of G2 or more toxicity was 22% (22/117 patients). Only 3 patients (2.5%) presented a G3 toxicity, as dermatitis (n = 1) or diarrhoea (n = 2). None of the patients presented a G3 (or more) hematologic toxicity and/or G4 non-hematologic toxicity. After a median follow-up time of 23.3 months (range, 4.8 - 66.8), only 2 pts (1.7%) presented a G3-4 late toxicity. The 3-year local control rate was 96.9% (95% confidence interval: 96.4 - 97.3%).

#### Conclusion

CRT delivered with HT and daily IGRT shows excellent rates of local control with few acute toxicity. Longer follow-up is needed to confirm these encouraging results.

#### EP-1261 Hypofractionated radiotherapy for inoperable rectal cancer: A retrospective analysis 2007 to 2015

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#### Purpose or Objective

Hypofractionated radiotherapy (HRT) preoperatively improves locoregional control (LRC) for resectable rectal cancer. In addition chemoradiotherapy alone provides complete response rates of 10-20%. For patients with localised disease, unfit for surgery or with metastatic disease, the efficacy of HRT regimens is less clear. We report a single centre study of HRT for non-surgically treated rectal cancer.

#### Material and Methods

We retrospectively reviewed all patients who received HRT between 2007 and 2015. Patients had histologically proven rectal cancer with localised or metastatic disease and were ineligible for surgery. The primary endpoint was overall survival (OS). Secondary endpoints were LRC, toxicity and objective symptom control.

#### Results

Between March 2007 and December 2015 48 patients received pelvic HRT for inoperable rectal cancer, 24 (50%) had locoregional disease. The median (range) age was 78 years (44-93), 17 (35%) patients had performance status 3. Dose/fractionation delivered was 27 Gy/6# in 3 weeks, 31 (64.6%) patients and 25 Gy/5# in 1 week, 12 patients, BED=88 Gy for both regimens. Median (range) time from diagnosis to RT was 2.5 months (0.5-74 months). RT was delivered with a 3D conformal technique in 81% of cases. Two (4%) patients were re-treated with 8 Gy/1# and 16 Gy/4#, after receiving 27 Gy/6# and 25Gy/5# respectively. At a median (range) follow up of 12 months (0.5-76), symptomatic improvement was documented in 19 (39.5%) patients. All patients completed the prescribed regimen. Two (4%) patients died within 30 days of treatment. The 1 and 2 year survival rates for all patients were 45.8% and 16.7% respectively. Median (IQR) OS for patients with localised and metastatic disease were 13.4 months (10.3-25) and 6.2 months (2.5-10.3) respectively. Of the 16 patients alive, 12 (75%) had localised disease with median (IQR) OS in this subgroup of 17.2 months (12.7-27.3).

#### Conclusion

Hypofractionated radiotherapy is efficacious and tolerable for patients with rectal cancer, ineligible for surgery. Long term control of localised disease control can be achieved in a minority. A prospective randomised study would further quantify the benefit of HRT for this poor prognosis rectal cancer subgroup.

#### EP-1262 EBRT And HDRBT in Rectal Cancer Patients Who Are Medically Unfit Or Refuse Surgery

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#### Purpose or Objective

TME surgery is the mainstay of treatment for rectal cancer. For those who are either medically unfit or refuse the operation, radiotherapy is frequently recommended but rarely leads to cure. There is recently some evidence suggesting dose escalation by adding HDRBT after EBRT is a feasible and promising strategy for this population. However, optimal dose fractionation regime remains

unclear on how to balance to tumor control and toxicity. Herein we reported our early experience on using EBRT and HDRBT in rectal cancer patients who are either unfit or refuse surgery.

#### Material and Methods

During the period of Jan-2015 to Sep-2016, total 12 consecutive patients treated with EBRT and HDRBT were analyzed; seven patients were because of medical inoperability, while five due to the refusal of surgery. Treatment consisted of EBRT with the regime (1.8Gy x 28, n=2; 5Gy x 5, n=4; 3Gy x 13, n=6) were at the discretion of physicians, followed by HDRBT boost given 8 weeks afterward. The starting dose level was 10Gy weekly x 1 fraction, with escalation to maximum 3 fractions if acute toxicity was acceptable. The primary endpoint was acute toxicity. Secondary endpoints were tumor response, local control, and survival. Patient responses were assessed based on endoscopy and MRI findings and classified as responding disease (CR + PR), static disease (SD) or progression (PD)

#### Results

At the time of current analysis 9 patients were still alive and, median follow-up time was 13.6 months (range: 5.7-19.2 months). Median age 79 years (range: 70-88), ECOG 2/3 (n=7/5), Charlson co-morbidity score <3 or ≥ 3 (n=6/6); cT3/cT4 (n=11/1), Node positive/ negative (n=6/6), MRI predicted mesorectal fascia threatened (≤1mm) or not (n=7/5). Planned dose of HDRBT 10Gy x 1 / 10Gy x 2 / 10Gy x 3 (n=6/3/3). One patient developed grade 3 toxicity (8.3%). Tumor response was observed in 10 patients (83%). The local control rate at 1 year and 2 years was 100% and 50% respectively. No patients received ≥2 fractions HDRBT boost developed local progression. At 1 year, the cancer specific survival was 81.5%, and the overall survival was 71.3%. Outcome related to dose level was reported in table 1

	10Gy x 1	10Gy x 2	10Gy x 3
Grade 3 acute toxicity	0/6	0/3	1/3
Tumor response	4/6	3/3	3/3
Local progression	2/6	0/3	0/3

#### Conclusion

In our early experience, the combination of EBRT and HDRBT achieves promising tumor response of 83% and 1-year local control rate of 100% with acceptable acute toxicity. Longer follow-up is ongoing. Randomized trials are warranted to determine the optimal dose level of HDRBT.

#### EP-1263 Short course radiotherapy, surgery & chemotherapy for stage IV rectal cancer with liver metastasis.

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#### Purpose or Objective

Resection of primary and liver lesions is the optimal management of Stage IV rectal cancer with liver metastases (Mets). The benefit of neoadjuvant in short course radiotherapy (5x5Gy) in terms of reduction of local recurrences and tumour downstaging have been well established with the publication of the Stockholm studies. Associating the benefit of both treatments by adding the effect of chemotherapy before or after liver surgery (some patients undergoing synchronous resection of the primary tumour and liver) and showing the data of our series of patients between 2014 and 2015 is the aim of our study

#### Material and Methods

16 patients were eligible for this study, 6 women and 10 men in age 50-78 years at the time of treatment. All of them were MRI based stage with 3 patients cT3N1, 5 cT4N2, 2 T4N1, 4 T3N2, 2 T2N2 and 1 to 3 liver Mets. We excluded of our study patients with more than 3 Mets because indication for surgery was ruled at diagnosis and only offered radiotherapy as palliation. Hypofractionated scheme radiotherapy was administered with a total dose of 25Gy and surgery was delayed for 7 days from the start of radiation therapy or at least 4 weeks as literature recommended. Chemotherapy used after surgery of the primary tumour was Folfox or Folfiri scheme with 3 or 6 cycles depending number of liver Mets and patient characteristics.

#### Results

After radiotherapy complexation, 5 patients were into surgical resection in one week, and only 2 had synchronous surgery. Pathological findings showed 12 partial response, 1 complete response and 2 stabilization of rectal tumour. Only 1 patient had a complete liver response after chemotherapy so he was excluded for liver surgery (Mets was not marked) At the time of liver surgery, 4 patients had lung and liver progression so they continued in second line chemotherapy. Until date, we've got 6 patients in follow-up without systemic therapy. The others progressed and are now under chemotherapy treatment. Only one patient died due to neoplastic disease.

#### Conclusion

Combined short course radiotherapy as neoadjuvant treatment in patients diagnosed of Stage IV rectal cancer with liver metastases follow of surgery and chemotherapy with curative intention can be a safe treatment option but must be demonstrated in future clinical trials.

#### EP-1264 Metabolic response and change in CEA level in rectal cancer patients treated with neoadjuvant CRT

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#### Purpose or Objective

We evaluated the significance of both metabolic response using <sup>18</sup>F-fluorodeoxyglucose-positron emission tomography/computed tomography (PET/CT) and change of serum carcinoembryonic antigen (CEA) level before and after preoperative chemoradiotherapy (CRT) as prognosticators for survival in patients with for rectal cancer.

#### Material and Methods

We retrospectively analyzed T3-T4 or N+ rectal cancer 196 patients who underwent preoperative CRT from October 2008 to June 2013. All patients received a median of 50.4 Gy in 28 fractions with 5-fluorouracil or capecitabine. The metabolic response was assessed by determining the maximal standardized uptake value (SUV<sub>max</sub>), absolute difference (ΔSUV<sub>max</sub>), and SUV reduction ratio (SRR) on pre- and post-CRT PET/CT scans. The serum CEA (pre-CRT and post-CRT), absolute difference (ΔCEA), CEA reduction ratio (CRR), and post-operative CEA (post-op CEA) were also determined. Multivariate analysis was performed using above parameters to determine any prognosticator for survival.

#### Results

Median follow-up period was 59 months. 5-year locoregional failure-free survival (LRFS), disease-free survival (DFS), and overall survival (OS) was 80.9 %, 66.0 %, and 86.8 %, respectively. Median pre-CRT SUV<sub>max</sub>, post-CRT SUV<sub>max</sub>, ΔSUV<sub>max</sub>, and SRR were 13.5, 4.9, 11.5, and 0.85, respectively. Median pre-CRT CEA, post-CRT CEA, ΔCEA, CRR, and post-op CEA were 4.42 ng/ml, 2.62 ng/ml, 1.38 ng/ml, 0.34, and 1.55 ng/ml, respectively. On